K-IMS

ENHANCE EFFICIENCY AND SAFETY
MAXIMIZING PERFORMANCE BY PROVIDING

THE FULL PICTURE

OUR MISSION
We shall earn the respect and recognition for our dedication to provide innovative and reliable marine electronics that ensure optimal operation at sea.
By utilising and integrating our technology, experience and competencies in positioning, hydroacoustics, communication, control, navigation, simulation, and automation, we aim to give our customers The Full Picture.
The Full Picture yields professional solutions and global services that make a difference enabling you to stay ahead of the competition.

OUR PHILOSOPHY
Our success depends on the success of our customers. Actively listening to our customers and truly understanding their needs, and then translating these needs into successful products and solutions is central to achieving our goal.
Our people are the key to our success and we empower them to achieve. Working together in a global network of knowledge, guided by our values, engenders innovation and world class performance. Every day we have to think a little differently, because every client is unique. We aspire to translate the imagination and dedication of our staff into successful technologies and solutions. Our commitment is to add value to your operations by providing you with The Full Picture.

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Kongsberg Maritime • May 2015 • Design & layout: DEON.NO
KONGSBERG INFORMATION MANAGEMENT SYSTEM

K-IMS is a communications platform developed by KONGSBERG for the offshore and maritime industry. A key element is flow of data and the interpretation of these combined with operational knowledge. Crucial for shared situational awareness is the ability to provide the right information in the right format, at the right time, to the right users.

K-IMS is designed to enable continuous access to data both on board and ashore through an interactive web based solution and to provide an efficient information flow. By collecting data from systems and sensors on board, distributing them in the right format to fleet management offices and/or suppliers support systems, K-IMS plays a vital part in creating the full picture of an ongoing operation.

K-IMS provides a complete and up-to-date information portal for better traceability and quality of communications between offshore and onshore organizations:
- Reduce operations and maintenance costs with advanced analytics and predictive capabilities.
- Reduce downtime: troubleshoot via remote access, with cross-vendors collaborative capabilities.
- Increase performance awareness and guide knowledge sharing.
- Single platform to gather, present and analyse data from different vendors.
- Reduce need for service personnel on board vessels.
- Certified Infrastructure, security and remote services.

KONGSBERG MARITIME Remote Services
THIRD PARTY SUPPLIER Support Office
FLEET Liquid Natural Gas Offshore Supply Vessel Offshore Production Unit Drilling
AVAILABLE EVERYWHERE

Managing a fleet of vessels involves complex processes and collaboration. Fact based decision making improves transparency and process performance. Global operations require the ability to act on information regardless of where a vessel or a user is located.

Continuous improvement
Key aspects of optimizing Fleet lifecycle management are Performance monitoring and optimisation, Optimisation across systems, Systems operations overview, Predictive and condition based maintenance. The ability to use data to obtain actionable knowledge, predictions and insights allows for continuous process improvements and optimal performance throughout the lifetime of assets.

Multi layered security
Collecting data from a multitude of systems and distribution of information, in time, to the right users across many systems and network boundaries. Strong security measures are vital to allow secure and easy access to the right information wherever the users are located. Networks segregation, Malware protection, encryption, authentication and authorization mechanisms protect all levels of information access.
WE BELIEVE IN USING SHARED INFORMATION TO IMPROVE COLLABORATION AND DECISION-MAKING

Our ambition

- To be the preferred provider of IMS INFRASTRUCTURE and customer added-value applications to the maritime and O&G market.

- Empower our customers to make knowledge-based decisions to improve their operation.

- Provide a cross-functional platform for decision making and collaboration.
WE BELIEVE IN USING SHARED INFORMATION TO IMPROVE COLLABORATION AND DECISION-MAKING.
Ship performance monitoring is a unique tool for providing ship owners’ total awareness of their fleet’s performance. Comparing vessel performance over time, with other vessels, will give insight into how to increase fuel efficiency and reduce carbon footprint. By sharing best practice and energy awareness throughout the fleet, the cost can be significantly reduced. Ship performance monitoring from KONGSBERG gives you the measures and the goals to reach. For easy collaboration both on- and offshore, it is designed to give the same information in the office as on the vessel. Analyse and drill down, to optimise the ship performance, by identifying the root cause of deviations.

**Benchmarking**
Increase the meaning of performance figures by comparing them to accurate reference values. Benchmarking of comparable vessels operating under comparable conditions, is available onboard and onshore, to increase performance awareness and to guide knowledge sharing and learning between crew and regions.

**Voyage and performance history**
Complete track history for all vessels onshore with key trends such as fuel efficiency, engine condition and hull performance.

**Fleet monitoring**
- Compare and share best practice and knowledge throughout the fleet.

**Engine performance**
- Continuous emission monitoring available.
- Faster and easier assistance to reduce fuel consumption.
- Emission values are presented real time and as long term trends.
- Main focus areas for main & auxiliary engines are:
  - combustion
  - fuel supply and injection
  - turbo-charging
  - cooling
  - lubrication

**Reports**
Automatically scheduled reports in various formats such as Excel and PDF.
- noon reports
- voyage report
- operation reports
- performance reports
All automatically generated from onboard systems and managed in a shared collaboration tool.
Remote operation is already a reality in subsea operations in the offshore industry. The end goal is to be able to deploy integrated systems, advanced navigation systems and sophisticated software that could manage smart sensor and actuator networks to maintain a vessel’s course in changing sea and weather conditions, avoid collisions, and operate the ship efficiently. Online monitoring and decision support can lift human performance, closing the gap between safety goals and current practice.

“To ensure a sustainable planet, humanity must limit global temperature increases to 2°C, achievable primarily by lowering carbon emissions. The shipping industry can be expected to reduce its total carbon output by at least 60 percent below present levels.”

DNV-GL report on The future of shipping.

With the introduction of ECA Zones and ever increasing demand for monitoring of the emission from each vessel, KONGSBERG presents an integrated, robust and unique emission monitoring solution. The system measures and analyses the process to determine the NOx emission with the help of a physical model based on the cylinder pressure measurements and the derived combustion analysis.

- Extension of KONGSBERG’s Engine diagnostic system.
- NOx, SOx and CO2 measurements according to MARPOL Annex VI NOx Technical code 2008.
- DNV GL class certification for calculation.
- Emissions are calculated based on process parameters of main and auxiliary engines.
VESSEL MANAGEMENT AND OPTIMISATION

Two-way real-time replication
Support the integrated operations way of work using real-time replication collaborative arena, for day-to-day operations between onshore and offshore sites. Two-way real-time replication enables users on all sites to access and work with the system simultaneously and independent of link downtime.

Optimise contracts
Manage contract details and link the contractual rates to operational, the time-log for the vessel. Rates for logged activities will be automatically adjusted.

Monitor and analyse
Monitor and analyse your operational and equipment downtime. Dashboard with downtime graphs and direct drill down to reported details. You can search in all logged data and display charts for downtime, compare vessels and shifts, set your performance targets and save your standard searches.

Reduce downtime
Reduce your downtime through better planning. A comprehensive planner tool that lets you integrate your maintenance and operational plan in order to avoid maintenance on the critical path and thus minimizing downtime.

History
Access a complete history of all operations. Easy access to all previous daily reports, accommodation data, exercises, safety meetings, experiences, lessons learned and all other data logged in the system.

Efficient
Enable your users to be more efficient. Made by and for offshore users. Intuitive, targeted and efficient system for the users. In addition eliminates the need for many spreadsheets and other ad hoc systems and solutions.

Standard process
Enable a standard process across units. Shared master data and unified reporting formats enables standardization of processes across units.

Best practices
Create best practices through accumulating experience and knowledge. Log positive and negative experiences related to operations and HSE. Create technical and operational lessons learned.

Easy access
Provide easy access anywhere – anytime. Also comes with web, tablet and mobile versions, enabling easy access to essential data anywhere.
FOR SOME PROBLEMS, MAKING THE RIGHT DECISION IN TIME IS THE MOST IMPORTANT THING
ENHANCE SAFETY

Emergency situation support is an electronic alternative to paper based procedures and check-lists on board vessels and installations. Displaying the different steps of a procedure, Emergency situation support manual and automatic execution of the procedure steps and displays executed procedures, stored as reports. The system fully replace paper based procedures and check-lists by providing electronic monitoring and execution.

Emergency situation support provides a graphical safety overview for all activities on all decks on the vessel. This makes it possible to quickly identify what happens on board and in a specific part of the vessel. Examples of objects that decision support system can monitor:
- fire detectors
- fans and dampers
- water tight doors and hatches
- flooding sensors
- A60 deck (Static)
- fuel and power lines (Static)
- emergency stop groups (static/dynamic).
- automatic CCTV activation on areas where flooding or fire alarms are active

All the objects are visualized on a multi-deck level vessel layout drawing. This gives the safety personnel a full real-time status for the vessel.

Emergency situation support improves your safe and efficient marine operations by:
- ensuring that correct procedures are followed and therefore no risk of tacit knowledge
- enabling compliance by always running the latest version of approved procedures and check-lists
- integrating safety check lists with the control system
- enabling onshore monitoring and control through the use of data replication by K-IMS
**IMPROVE MAINTENANCE**

**Fleet asset management**
Turn available operational data into increased predictability of your assets across the fleet. Comparing the operation of identical equipment on different vessels can advise proactive maintenance measures and increased predictability. With your organisation common asset structure as the backbone, users of K-IMS will have benefits in searching for the right operational data for their analysis.

**KPI integration**
Integration of performance indicator across systems is vital for getting the full overview of actual asset operation. Aggregation of lower level performance indicators into top-level KPIs is a proven approach to performance management as the condition and operation of sub-components is crucial for the total system operational predictability and need for maintenance.

**Equipment analyser**
Lets you interactively review key operational data such as load and utilization of equipment. Playback of events and key parameters in a unique and easy-to-use operator screen.

**Engine startup times**
Monitor engines startup times to detect the smallest deviation from normal behaviour for early detection of condition degradation.

**Motor monitor**
The application covers basic maintenance related operational information such as running hours and the number of operations (start/stops) for each motor.

**Valve activity**
This application gives the overview of operational data for valves in order to list status for each valve.

**Barrier test**
Is an application for leakage testing of safety critical valves. An individual test procedure is specified for each valve and the report can be used as a verification to fulfil the SIL calculation for the installation.

**Engine condition monitoring**
Advice for irregularities and changing conditions of the engine presented in failure matrix. Increasing reliability and system safety. Valuable information regarding probable malfunction or upcoming failure of the engine, which could lead to, increased fuel consumption.

**Inhibit log**
Provides a list of all inhibits, overrides and module modes that are set or removed within a specified time span and related to work permit key data.
K-IMS Operations and planning can reduce downtime and enhance reliability by providing a tool that can aid the crew in making better decisions. Hydrocarbon resource development is moving into frontier areas where there is limited experience of operations. Exploration in the Arctic poses unique challenges like limited season, limited experience and high impact consequences caused by delays due to non availability of equipment required to deliver mission objectives.

K-IMS provides an environment, which can be used for operation planning and training, and also as a knowledge base and information portal for the vessel’s systems and their interdependencies.

The operator can set up a planned configuration for a given operation and immediately get feedback and guidance on whether a planned scenario is impossible or involves increased risk compared to the recommended system configuration.

By visualizing the effects of the dependencies between operations, operational equipment, power plant, riser management and dynamic positioning systems, K-IMS Operations planning tool provides the following main characteristics:

- interactive advisory and decision aiding tool
- allows "What-if" analysis
- supplements communications with reports from analysis
- consequence analyser
- one-stop access to information on vessel systems
- facilitates training
- WSOG support and onshore playback analysis
- activity specific dependencies (from operator or drilling contractor)
- incidents of the past/lesson learned
The main purpose of the system is to share data and information between all users and systems involved in safe and efficient marine operations. Information is collected from multiple sources and presented to multiple users via a secure infrastructure and a web based portal. It combines IT and business processes to improve business operations and decision support.

K-IMS is an open platform for enabling information sharing and collaboration. It is the bridge between offshore marine systems and onshore business enterprises. On top of this platform a wide range of information management applications can be deployed.

The ability to manage all data and information from different systems onboard in a safe and efficient manner enables a new level of possibility to analyse and monitor situations, critical operations and installation conditions. To handle the large amount of data, proper Visualisation tools are essential in order to assist the user to be efficient in critical operations. The system will ease the daily routines and lower the operational cost. It will ensure that the right information is available to the right user at the right time.

Combine all essential information from different systems onboard (Power management, Integrated automation, Riser management, Dynamic positioning) in combined views for optimal focus on position surveillance and riser operability.

Stay ahead of weather. Uniquely integrating simulation of Dynamic positioning and Riser management, the system can give the crew guidelines about vessel/rig behaviour based on weather forecast.

Decision support tool contains several modular dashboard instrument packages:
- **Mooring view** gives the user information about the mooring situation.
- **Riser angle** displays the size of the riser’s angle and the riser’s angle orientation for the upper flex joint, the lower flex joint, the BOP inclination angle value and BOP inclination angle orientation.
- **Mooring line detail** shows the details of the mooring lines.
- **Thrust main** shows the vessel heading and thruster running indications and force.
- **Status bar** shows the dynamic environmental information from wind and current. It indicates if a new document has been imported to a specific folder, and it shows an “alarm” indication.

All application views support playback, enabling historical analysis and review of operations and decision making.
MAKE THE RIGHT DECISIONS

Crowd management is a system for personnel tracking in and during emergency situations. In an emergency situation, an accurate overview is necessary for taking the right decisions for your personnel.

The system gives you this information live, for complete situation awareness and supporting you through the necessary actions.

Crowd management implements wireless technology with the use of hand-held devices, each one of them containing the complete manifest for the installation, ensuring high availability and redundancy. Crowd management replaces the paper-based system, reducing the cost of drills and training of safety roles thus making it less prone to human errors and communication problems.

Crowd management also features replication of the manifest and mustering situation onshore, giving the office necessary information to take action in supporting the vessel.

- **Safety desk function** keep track of evacuated areas, areas with smoke or water, fire teams and other key teams. Features replay functionality.
- **Gangway function** for keeping track of the personnel going on and off the vessel.
- **Implements plans** like fire plan, safety plan and damage plan for decision support.
- Onshore monitoring of mustering and historical KPI data for all crowd management processes.
- **Exact location** capabilities through K-IMS Infrastructure to enable onshore real-time monitoring of mustering and historical KPI data for all crowd management processes.
- **Track personnel** with wristbands through specific rooms, such as ECR, bridge, engine room.
- **Automatic personal messaging** (text to wristbands) when hazardous areas are accessed.

**Management and accommodation**
Handle personnel logistics and Personnel on board (POB), be compliant with the latest safety and security requirements:
- fleet-wide personnel register
- personnel on board (POB)
- arriving and departing flights
- work hours
- cabin administration
- emergency preparedness
- lifeboat mustering

Crowd management is a system for personnel tracking in and during emergency situations. In an emergency situation, an accurate overview is necessary for taking the right decisions for your personnel.
GLOBAL SYSTEM TOOLS

Dashboards
The dashboard application provides a fully comprehensive and customizable visualisation of the data acquired from a particular vessel. Customised dashboards can be created by the user and arranged in the desired order.

The dashboard has a set of instruments used for visualisation and the user can select any instrument to represent the data required for a specific dashboard.

Sharing user created dashboards with other users on the vessel, on other vessels in the fleet and onshore.

Live dashboards can be viewed with near real-time data.

History dashboards featuring playback of history from the past for analysing situations.

Trend
The Trend application allows the user to analyse trends and alarms for selected tags/sensors from all systems on the vessels.

Historic data can be viewed by selecting date and time period. Alarm frequency is indicated on the time-line to enhance the troubleshooting process.
- Data analysis client for combined analysis of alarm and event, and time series data.
- Visualisation of alarms and alarm information on trend.
- Save, share and reuse user defined trend views.

Alarms and events
Alarms and events analyses such as:
- most frequent alarms view
- filter and pivot alarm data based on time, tag, description and alarm text

Reports
The Report application is designed to create, display, and export reports.
- design mode and view mode
- provides access to all accessible recorded data
- export data to Word, HTML and PDF
- publish and share reports

Documents
Documents is a tool for storing files and documents within the K-IMS system. All information objects support meta-data tagging and relation of information to assets and domain model information in the system.

Export data
Export data is a specific tool for exporting historical data to a common file format for later use.
- multiple tag selection
- export of time-series and Alarms and events
- MS Excel compatible export format
- automatic export engine. E.g. daily exports
MALWARE PROTECTION

Kongsberg Malware protection is designed to work in a maritime environment. Malicious software can cause serious damage and downtime for vessels. Updated Malware protection is vital to ensure a safe and efficient operation.

With Malware protection, KONGSBERG has redefined control system Malware protection.

- No negative impact on critical control systems equipment.
- Always updated Malware protection.
- Network protection, securing critical networks.
- USB protection.
- Supports low band with high latency satellite connections.
- Alarms and notifications through SNMP.
- High availability.
- Portable updated scan engine.
K-Remote uses online system and health monitoring to provide KONGSBERG customer support with remote access to ensure reliability.

The global network solution consists of two groups of devices, communication hubs and node network devices. All network traffic between network devices are encrypted. Any IP-based communication link can be utilized as a communication carrier.

REMOTE SERVICES

Online service for instant analysis and assistance:
- operational support and guidance
- inspection of on-board systems and interfaces
- preparation and investigation prior to service visits
- remote update of on-board systems
- remote commissioning
The infrastructure includes system components such as portal, data logging, secure network, malware protection, replication, security and integration by standard protocols such as OPC and web services.

- Unites all data logging and communication into a single, secure and maintainable solution.
- Service Oriented Architecture (SOA) enables an information highway for applications across control systems, third party systems and business systems.
- The portal is role based and views are customizable for each user. The portal is based on rich internet application technology and can be accessed by a web browser, providing an intuitive user interface.

**Portal**
The K-IMS portal integrates applications, and provides user defined perspectives. The end user can compose a customised portal view, selecting from applications, reports, dashboards and additional features available.

The KONGSBERG portal is built on modern industry standard technology, utilizing SOA on the server side, providing an open application platform for KONGSBERG and 3rd party suppliers.

**Layers of protection**
Platform design based on WIB DACA topology.
LIFE CYCLE SUPPORT

Designed to purpose – maintained to last
Our life cycle management service will assist our customers throughout all the phases, from design to commissioning and during the operational life time. Solid in-house competence, both in system design and user competence enables us to provide solutions that are fit to purpose and thus yields efficiency in operation.

Our common base technology provides robust designs, with few and reliable parts, an excellent foundation to maximize the output at competitive costs. The distributed and open system design employs an industry standard communication network. Standard hardware components used for various applications and the open network approach results in:
- increased reliability
- competitive life-cycle support
- easy up-grade solutions

Evergreen
We offer continuous hardware and software upgrade to keep your vessel at maximum efficiency. Our system is designed with consistent boundaries between individual systems and control segments. This design strategy makes it easy to add new functionality or complete new control segments thus enable us to offer upgrades step by step to keep your system evergreen.

Training
Qualified personnel are one of your major assets in efficient and safe operations. Thus, we offer modular training courses for all major subjects – from operator training to technical training that keeps your crew fit on the job.

Supported by professionals
Our systems are easy to install and maintain – supported by professionals either on-site or through remote connectivity. They are designed for optimal operational availability and allow for favourable lifecycle expenditure.
We are always there, wherever you need us. KONGSBERG’s customer services organisation is designed to provide high-quality, global support, whenever and wherever it is needed. We are committed to providing easy access to support and service, and to responding promptly to your needs. Support and service activities are supervised from our headquarters in Norway, with service and support centres at strategic locations around the globe – where you are and the action is.

As part of our commitment to total customer satisfaction, we offer a wide variety of services to meet individual customers’ operational needs. Global support 24/7 is a solution designed to give round-the-clock support. For mission-critical operations, Global support 24/7 can be extended to include remote monitoring. We can adapt the level of support needs by offering service agreements, on-site spare part stocks and quick on-site response arrangements.

Global and local support
We provide global support from local service and support facilities at strategic locations world wide. Service and support work is carried out under the supervision of your personal account manager, who will ensure that you receive high-quality service and support where and when you need it. Your account manager will ensure continuity and work closely with your personnel to improve and optimise system availability and performance. Under the direction of your account manager, and with a local inventory of spare parts, our well qualified field service engineers will be able to help you quickly and effectively.

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